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# THE SCHOOL REVIEW

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## SPACE-PROVISIONS IN THE FLOOR-PLANS OF MODERN HIGH-SCHOOL BUILDINGS

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### NATURE, MATERIALS, AND METHOD OF THE STUDY

What are the more common kinds of space-provision made in the floor-plans of recently constructed high-school buildings? In what proportionate frequency are certain of the newer sorts of space-provision finding a place in these floor-plans? School officers contemplating the erection of high-school buildings often desire answers to these and related questions. This study essays a partial answer.

The facts presented are drawn from a tabulation of the kinds of space-provision made in the floor-plans of 156 high-school buildings erected during the decade 1908-17. The floor-plans were reproduced in the twenty volumes (XXXVIII-LVII) of the *American School Board Journal* for this decade and the tabulations made from these reproductions. This total number of 156 floor-plans does not include all those reproduced in the volumes designated, as some plans were omitted from consideration because the complete floor-plans were not included, some because the lettering in them was indistinct owing to reduction in size of the original in reproduction, and a few others for miscellaneous reasons.

It is advisable to state in some detail the method of tabulation that was followed. The writer first made a working list of space-provisions by examining twenty floor-plans and noting the kinds of space-provisions which had been made. The names of the 120 sorts thus found were introduced into a mimeographed form that provided space for tabulation building by building, i.e., provided for each set of floor-plans a column of blank spaces in which were to be checked the number of times each kind of space-provision had been made. Additional blank spaces were provided for other sorts of space-provisions found which would not obviously classify under the sorts already listed. The work of recording the space-provisions in the mimeographed forms was done as an exercise by twenty members of a class in high-school administration made up of advanced undergraduate and graduate students, who, notwithstanding the simplicity of the task, were given careful oral and written directions as to the mode of procedure to be followed in tabulation. To each member of the class were assigned the floor-plans in one volume of the journal named. In order to give reasonable assurance of the accuracy of the findings, after this preliminary work of tabulation had been done, the writer tested the accuracy of each student's report by checking the space-provisions reported for at least two sets of plans. When inaccuracies in the work of original tabulation were discovered, all the floor-plans in the volume assigned to the student were re-checked.

It should be stated that the entries in the mimeographed forms showed the *presence only*, not the *area*, of a space-provision in the floor-plan. As relatively few of the plans as reproduced include dimensions, the students were not required to compute and record the latter.

The next step in assembling the materials of the study was the final one of making the number and percentage distributions of space-provisions, as shown in the tables reproduced

here. In this final step space-provisions for furnace-rooms, fanrooms, coal-pits, etc., were excluded, because it was found that in many plans some of these were left undesignated in basement or ground floor-plans or were to be provided for in separate or attached buildings, plans of which were not reproduced. The numbers and percentages that would have resulted from a tabulation of such as were designated would not have been representative. Space-provisions for vestibules, corridors, flues, etc., were also omitted from the final tabulations.

The fact that the plans were for buildings erected in communities ranging in population from a few hundred to our largest city made it possible to give some attention to the different kinds of space-provisions by *size of community*.<sup>1</sup> The distribution of these communities by size showed that the groups would be approximately equal in number if the population of 10,000 were used as the line of division. The final tabulations were, therefore, made for (1) communities of 10,000 population and less, (2) communities of more than 10,000, and (3) all communities. As the period under consideration has been one of rapid change for the high school, and as it was believed that this might be reflected to some extent in the space-provisions, distributions were made also according to the half-decade in which the high-school building was erected. The numbers of buildings in each of these groups may be seen by referring to the lowest row of figures in each of the tables.

#### THE KINDS OF SPACE-PROVISIONS

*The wide range of kinds of space-provisions.*—The first fact by which one is struck in glancing down the kinds of space-provision listed in the tables is their wide range. Table I, which reports the frequency of appearance of the space-provi-

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<sup>1</sup> The word "community" is used rather than "city" or "village" because in several instances plans of township, county, or union high-school buildings were used.

TABLE I

KINDS OF SPACE-PROVISIONS AND NUMBERS AND PERCENTAGES OF FLOOR-PLANS OF HIGH SCHOOLS IN WHICH SUCH SPACE-PROVISIONS HAVE BEEN MADE

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908-12			1913-17			1908-17			1908-12			1913-17			1908-17		
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
1. Class- and recitation-rooms.....	40	100.0	44	100.0	84	100.0	32	100.0	39	97.5	71	98.6	72	100.0	83	98.8	155	99.4
2. Science rooms and laboratories.....	10	25.0	10	22.7	20	23.8	9	28.1	4	10.0	13	18.1	19	26.4	14	16.7	38	24.2
3. Elementary or general science laboratory.....	2	5.0	2	4.5	4	4.8	.....	.....	2	5.0	2	2.8	2	2.8	4	4.8	6	3.8
4. Botany laboratory.....	1	2.5	2	4.5	5	5.9	4	12.5	8	20.0	12	16.7	3	7.0	10	12.5	15	9.6
5. Greenhouse or conservatory.....	2	5.0	3	6.8	5	5.9	1	3.1	1	2.5	6	8.3	3	4.2	8	9.6	11	7.0
6. Agriculture laboratory.....	1	2.5	1	2.3	2	2.4	.....	.....	1	2.5	1	1.4	1	1.4	2	2.5	3	1.9
7. Zoology laboratory.....	1	2.5	1	2.3	2	2.4	.....	.....	6	15.0	8	11.1	3	4.2	7	8.3	10	6.4
8. Biology laboratory.....	8	20.0	5	11.4	13	15.5	12	37.5	18	45.0	36	50.0	26	36.1	23	27.4	40	31.2
9. Physiology laboratory.....	.....	.....	.....	.....	.....	.....	12	37.5	.....	.....	9	12.5	7	9.0	.....	.....	.....	.....
10. Geography laboratory.....	.....	.....	2	4.5	2	2.4	12	37.5	.....	.....	5	6.8	10	13.9	13	15.5	7	4.5
11. Chemistry laboratory.....	19	47.5	22	50.0	41	48.8	23	71.9	26	65.0	49	66.7	42	56.3	48	57.1	90	57.7
12. Physics laboratory.....	17	42.5	23	47.7	38	45.2	23	71.9	23	57.5	46	63.9	40	52.6	44	52.4	84	53.8
13. Electrical laboratory.....	.....	.....	.....	.....	.....	.....	4	12.5	3	7.5	7	9.7	7	9.0	.....	.....	.....	.....
14. Lecture or demonstration rooms.....	13	32.5	22	50.0	35	41.7	20	62.5	24	60.0	44	61.1	33	43.8	46	54.8	70	50.0
15. Dark room.....	1	2.5	12	27.3	18	21.4	9	28.1	13	32.5	22	30.6	15	20.0	25	29.8	40	25.0
16. Balance room.....	1	2.5	.....	.....	1	1.2	3	9.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
17. Apparatus rooms (for science).....	6	15.0	11	25.0	17	20.2	11	34.4	17	42.5	28	38.0	17	22.0	28	33.3	45	29.8
18. Manual-training room or shop.....	18	45.0	26	61.4	46	54.8	11	34.4	11	27.5	22	30.6	20	26.3	33	39.6	68	43.8
19. Woodworking room or shop.....	4	10.0	4	9.1	8	9.5	10	28.1	8	20.0	17	23.6	13	18.1	12	14.2	25	16.0
20. Bath room or shop.....	1	2.5	.....	.....	1	1.2	3	9.4	3	7.5	6	8.3	4	5.3	3	3.6	7	4.5
21. Cabinet-making room or shop.....	.....	.....	2	4.5	2	2.4	2	6.3	3	7.5	8	11.1	2	2.6	8	9.6	10	6.4
22. Carpentry room or shop.....	1	2.5	.....	.....	1	1.2	.....	.....	5	12.5	15	20.0	1	1.4	5	6.0	6	3.8
23. Joinery room or shop.....	.....	.....	.....	.....	.....	.....	3	9.4	.....	.....	3	4.2	4	5.3	.....	.....	.....	.....
24. Wood.....	1	2.5	.....	.....	.....	.....	9	28.1	7	17.5	16	22.2	9	12.0	7	8.3	16	10.3
25. Lathes room or shop.....	.....	.....	.....	.....	.....	.....	3	9.4	.....	.....	6	8.3	4	5.3	3	3.6	7	4.5
26. Machine-room or shop.....	3	7.5	4	9.1	7	8.3	10	31.3	15	37.5	25	34.7	13	18.0	19	22.6	32	20.5
27. Mill room or shop.....	.....	.....	.....	.....	.....	.....	1	3.1	3	7.5	4	5.6	1	1.4	4	4.8	5	3.2
28. Forge or blacksmithing room or shop.....	4	10.0	4	9.1	8	9.5	13	40.1	8	20.0	21	29.2	17	23.0	12	14.2	20	13.6
29. Forge or mauling room or shop.....	1	2.5	1	2.3	2	2.4	9	28.1	8	20.0	17	23.6	10	13.0	10	12.5	19	12.2
30. Forge and foundry room or shop.....	.....	.....	.....	.....	.....	.....	1	3.1	7	17.5	8	11.1	1	1.4	8	9.6	9	5.8
31. Sheet-metal shop.....	.....	.....	.....	.....	.....	.....	2	6.3	2	5.0	4	5.6	2	2.6	2	2.4	4	2.6
32. Art-metal room or shop.....	.....	.....	2	4.5	2	2.4	2	6.3	2	5.0	4	5.6	2	2.6	4	4.8	6	3.8

TABLE I—Continued  
KINDS OF SPACE-PROVISIONS AND NUMBERS AND PERCENTAGES OF FLOOR-PLANS OF HIGH SCHOOLS IN WHICH SUCH  
SPACE-PROVISIONS HAVE BEEN MADE

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908-12			1913-17			1908-12			1913-17			1908-12			1913-17		
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
33. Plumbing room or shop.....	3	7.5	2	4.5	14	31.8	10	31.3	1	2.5	24	33.3	13	18.1	3	3.6	3	1.9
34. Stock- or lumber-room.....	1	2.5	17	11.4	6	7.1	3	9.4	7	17.5	10	13.9	4	5.6	28	33.3	41	26.3
35. Finishing room.....			1	2.3	1	1.2			5	12.5	5	7.0			12	14.2	16	10.3
36. Assembling and finishing room.....			2	4.5	2	2.4			1	2.5	1	1.4			6	7.1	6	3.8
37. Stock and finishing room.....			5	11.4	5	6.0			1	2.5	12	16.7			3	3.6	3	1.9
38. Tool rooms.....			2	4.5	2	2.4			1	2.5	39	54.2			10	11.9	17	10.9
39. Mechanical-drawing rooms.....	7	17.5	16	21.4	5	6.0	7	21.9	5	12.5	12	16.7	7	9.7	30	35.7	55	35.3
40. Printing-room or shop.....			2	4.5	2	2.4			18	56.3	4	5.6			25	34.7	30	19.9
41. Domestic-science rooms or laboratories.....	11	27.5	31	45.5	14	33.8	1	3.1	21	72.5	23	31.9	1	1.4	5	6.0	6	3.8
42. Sewing-room or laboratory.....	7	17.5	18	25.0	15	43.8	9	46.9	9	22.5	42	56.3	22	30.6	29	34.5	54	34.6
43. Dressmaking room or laboratory.....			1	2.3	1	1.2			2	6.3	2	2.8			38	45.2	60	38.5
44. Fitting-room.....			4	9.1	4	4.8	5	15.6	12	30.0	17	23.6	5	7.0	16	21.4	21	13.4
45. Design room or laboratory.....			1	2.3	1	1.2	1	3.1	2	5.0	3	4.2	1	1.4	3	3.6	4	2.6
46. Millinery room or laboratory.....			1	2.3	1	1.2	2	6.3	6	15.0	8	11.1	2	2.8	7	8.3	9	5.8
47. Sewing and millinery room or labora- tory.....			3	6.8	4	4.8	1	3.1	31	50	3	4.2	2	2.8	5	6.0	7	4.5
48. Cooking-room or laboratory.....	8	20.0	15	34.1	23	27.4	12	37.5	2	77.5	43	57.7	20	27.8	46	54.8	66	42.3
49. Domestic or food-chemistry labora- tory.....			1	2.3	1	2.4				5.0	2	2.8			3	3.6	4	2.6
50. Living (or reception) room.....	1	2.5	1	2.3	6	4.8	2	6.3	9	22.5	11	15.3	3	4.2	12	14.2	15	9.6
51. Dining-room.....	6	15.0	11	25.0	17	22.6	13	40.7	22	55.0	35	48.6	19	26.4	33	39.3	52	33.3
52. Pantry.....	3	7.5	3	6.8	6	7.1	7	21.9	19	47.5	26	36.1	10	13.9	22	26.2	32	20.5
53. Bedroom.....	1	2.5	3	6.8	4	4.8	3	9.4	11	27.5	14	19.5	4	5.6	14	16.7	18	11.5
54. Laundry.....			3	6.8	3	3.6	5	15.6	14	35.0	19	26.4	5	7.0	17	20.2	22	14.1
55. Bath.....			2	4.5	2	2.4	1	3.1	6	15.0	7	9.7	1	1.4	8	9.5	9	5.8
56. Supply-room (for domestic science).....	3	7.5	11	18.2	23	27.4	19	28.1	11	27.5	20	27.8	12	16.7	19	22.6	31	19.9
57. Commercial rooms.....	9	22.5	10	22.7	19	22.6	13	40.7	9	22.5	22	30.6	22	30.6	19	22.6	41	26.3
58. Typewriting rooms.....	6	15.0	15	34.1	21	25.0	10	31.3	15	37.5	25	34.7	16	22.3	30	35.7	46	29.4
59. Stenography (or dictation rooms).....	2	5.0	4	9.1	6	7.1	5	15.6	10	25.0	15	20.9	7	9.7	14	16.7	21	13.4
60. Stenography and typewriting rooms.....	2	5.0	2	22.7	12	14.2	2	6.3	3	7.5	2	2.8	4	5.6	2	2.6	6	3.8
61. Bookkeeping rooms.....	2	5.0	7	15.9	9	10.7	2	6.3	11	27.5	16	22.2	7	9.7	21	25.0	28	17.9
62. Banking rooms.....							2	6.3	4	10.0	6	8.3	4	5.6	11	23.1	15	9.6

TABLE I—Continued  
KINDS OF SPACE-PROVISIONS AND NUMBERS AND PERCENTAGES OF FLOOR-PLANS OF HIGH SCHOOLS IN WHICH SUCH  
SPACE-PROVISIONS HAVE BEEN MADE

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908-12			1913-17			1908-12			1913-17			1908-12			1913-17		
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
63. Geography rooms (for commercial work).....	1	2.5	1	2.3	2	2.4	1	3.1	1	2.5	2	2.8	2	2.8	2	2.4	4	2.6
64. Art rooms.....	1	2.5	1	4.5	3	3.6	2	6.3	2	17.5	9	12.5	2	4.2	2	10.7	12	7.7
65. Freehand drawing rooms.....	3	7.5	5	11.4	8	9.5	11	34.3	13	32.5	24	33.3	14	19.5	18	21.4	32	20.5
66. Modeling rooms.....	1	2.5	1	2.3	2	2.4	2	6.3	3	7.5	3	4.2	1	1.4	4	4.8	5	3.2
67. Exhibit hall or room (for art).....	1	2.5	2	4.5	3	3.6	2	6.3	4	10.0	6	8.3	3	4.2	6	7.1	9	5.8
68. Music rooms.....	2	5.0	7	15.9	9	10.7	7	21.9	12	30.0	19	26.4	9	12.5	19	22.6	28	17.9
69. Library rooms.....	26	65.0	24	54.6	50	59.5	26	81.3	26	65.0	52	72.3	52	72.3	50	59.5	102	65.4
70. Library stackrooms.....	1	2.5	1	2.3	2	2.4	2	6.3	6	15.0	8	11.1	3	4.2	7	8.3	10	6.4
71. Club, society, or recreation room.....	3	6.8	3	3.6	3	3.6	3	9.4	8	20.0	11	15.3	3	4.2	11	23.1	14	8.9
72. Gymnasiums.....	20	50.0	26	59.1	46	54.8	20	62.5	20	50.0	40	55.6	40	55.6	46	54.8	86	55.1
73. Boys' gymnasiums.....	3	6.8	3	3.6	3	3.6	6	18.8	6	15.0	12	16.7	6	8.3	9	10.7	15	9.6
74. Girls' gymnasiums.....	2	4.5	2	2.4	2	2.4	6	18.8	6	15.0	12	16.7	6	8.3	8	9.5	14	8.9
75. Running tracks.....	1	2.5	1	2.3	1	1.2	3	9.4	8	20.0	11	15.3	3	4.2	8	9.5	12	7.7
76. Swimming-pools (or natatoria).....	1	2.5	1	1.2	1	1.2	3	9.4	7	17.5	10	13.9	3	4.2	8	9.5	11	7.0
77. Lavatories or shower-rooms.....	5	12.5	12	27.3	17	20.2	16	50.0	16	40.0	32	44.5	21	29.2	28	33.3	49	31.4
78. Dressing rooms.....	2	5.0	6	13.6	9	14.3	14	43.8	4	10.0	18	25.0	16	22.3	10	11.9	26	16.7
79. Physical director's offices.....	2	4.5	2	4.5	2	2.4	4	12.5	11	27.5	15	20.9	4	5.6	13	15.5	17	10.9
80. Woman physical director's offices.....	1	2.5	3	6.8	4	4.8	2	6.3	5	12.5	5	7.0	3	4.2	5	6.0	5	3.2
81. Locker-rooms.....	12	30.0	19	43.2	31	36.9	19	59.4	24	60.0	43	57.7	31	43.1	43	51.2	74	47.4
82. Boys' locker-rooms.....	11	27.5	19	43.2	30	35.7	20	62.5	23	57.5	43	57.7	31	43.1	42	50.0	73	46.8
83. Girls' locker-rooms.....	8	20.0	21	47.7	29	34.5	9	28.1	19	25.0	19	34.7	17	23.6	31	36.9	48	30.8
84. Wardrobes or cloakrooms.....	30	75.0	34	77.3	64	76.2	23	71.9	33	82.5	56	77.8	53	73.7	67	79.8	120	76.9
85. Assembly rooms or auditoriums.....	19	47.5	30	68.2	49	56.3	19	59.4	28	70.0	47	65.3	38	52.8	58	69.0	96	61.5
86. Stage (in assembly room or auditorium).....	7	17.5	12	27.3	19	22.6	15	46.9	20	50.0	35	46.6	22	30.6	32	38.1	54	34.6
87. Dressing or ante-rooms (for stage).....	9	22.5	16	36.4	25	29.8	13	40.7	21	52.5	34	47.2	22	30.6	37	44.0	59	37.8
88. Study-rooms or halls.....	1	2.5	1	1.2	1	1.2	2	6.3	3	7.5	2	2.8	3	4.2	3	3.7	3	1.9
89. Session-rooms.....	5	12.5	10	22.7	15	17.9	10	31.3	13	32.5	23	31.9	15	20.9	23	27.4	38	24.3
90. Lunchrooms.....	1	2.5	1	2.3	2	2.4	2	6.3	8	20.0	10	13.9	6	8.3	11	23.1	17	10.9
91. Boys' lunchrooms.....	4	10.0	3	6.8	7	8.3	2	6.3	8	20.0	10	13.9	7	9.7	12	14.2	19	12.2
92. Girls' lunchrooms.....	5	12.5	4	9.1	9	10.7	2	6.3	8	20.0	10	13.9	7	9.7	12	14.2	19	12.2

TABLE I—Continued  
KINDS OF SPACE-PROVISIONS AND NUMBERS AND PERCENTAGES OF FLOOR-PLANS OF HIGH SCHOOLS IN WHICH SUCH  
SPACE-PROVISIONS HAVE BEEN MADE

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908-12			1913-17			1908-12			1913-17			1908-12			1913-17		
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
93. Kitchens (for lunchrooms).....	2	5.0	4	4.8	2	4.5	7	21.9	11	27.5	18	25.0	9	12.5	13	15.5	22	14.1
94. Principal's offices.....	32	80.0	68	81.0	36	81.8	31	96.9	36	90.0	67	93.0	63	85.5	72	91.7	135	86.5
95. Reception- or waiting-rooms (for principal's office).....	10	25.0	25	34.1	15	34.1	20	62.5	20	50.0	40	55.6	30	41.7	35	41.7	65	41.7
96. Vaults.....	2	5.0	7	8.3	5	11.4	5	15.6	5	12.5	10	13.9	7	9.7	10	11.9	17	10.9
97. Assistant or vice-principal's offices.....	2	5.0	6	7.1	4	9.1	5	15.6	5	12.5	10	13.9	7	9.7	9	10.7	16	10.3
98. Teachers' offices.....	2	5.0	11	13.1	11	25.0	8	25.0	9	22.5	14	19.5	5	7.0	20	23.8	25	16.0
99. Men teachers' rooms.....	2	5.0	8	9.5	6	13.6	8	25.0	7	17.5	15	20.9	10	13.9	13	15.5	23	14.7
100. Women teachers' rest rooms.....	5	12.5	13	15.5	10	31.3	18	45.0	18	45.0	28	38.9	15	20.9	26	31.0	41	25.6
101. Teachers' rest or retiring-rooms.....	10	25.0	25	29.8	15	34.1	15	46.9	15	37.5	30	41.7	25	34.7	30	35.0	55	35.3
102. Emergency or rest rooms.....	1	2.5	9	11.9	10	20.5	6	18.8	12	30.0	18	25.0	7	9.7	21	25.0	28	17.9
103. Girls' rest rooms.....	1	2.5	8	9.5	7	15.9	1	3.1	1	2.5	2	2.8	2	2.8	3	3.6	5	6.4
104. Textbook rooms.....	3	7.5	4	4.8	4	9.1	6	18.8	1	2.5	5	6.9	2	2.8	8	9.5	10	6.4
105. Storage-rooms.....	12	30.0	34	40.5	22	50.0	19	59.4	26	63.0	45	62.5	31	43.1	48	57.1	79	50.6
106. Janitor's rooms.....	12	30.0	25	29.8	13	29.5	12	37.5	14	35.0	26	36.1	24	33.3	27	32.7	51	32.7
107. Boys' toilets.....	29	72.5	39	88.6	39	88.6	25	78.1	36	90.0	61	84.7	54	75.0	75	89.3	129	82.7
108. Girls' toilets.....	29	72.5	39	88.6	39	88.6	25	78.1	36	90.0	61	84.7	54	75.0	75	89.3	129	82.7
109. Bicycle-rooms.....	2	5.0	6	7.1	4	9.1	5	15.6	3	7.5	8	11.1	7	9.7	7	8.3	14	8.9
Number of floor-plans in group.....	40	.....	44	.....	44	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....



sions found at least three times in the 156 floor-plans examined, contains 109 kinds. If to these are added those appearing only once or twice in the floor-plans, of many of which mention is made in the succeeding sections of this report, this number is increased to nearly 150. And if to this total are added the many sorts of space-provision not reported upon in this study, including space for boilers, fuel, ashes, fans, engines, flues, vestibules, corridors, etc., this total would mount up easily to 200 different sorts. Truly, space-provisions in modern high-school buildings are little short of protean! By contrast, the older high-school buildings with their classrooms, study-hall, and little else were simple indeed.

*Class- and recitation-rooms.*—The first kind of space-provision listed in Table I, class- and recitation-rooms, is seen to be all but universal in both half-decades and in cities of all sizes. This table does not show what the original tabulations show—that classrooms are much more frequently reported than are recitation rooms; that, in fact, the former are almost always provided; that the latter are provided in almost half the plans; and that, therefore, many of the schools provide both, recognizing a distinction between them. Very few of the plans assign these classrooms to special academic subjects, e.g., to mathematics, history, etc.

*Science rooms.*—The more common kinds of space-provisions made for science in the floor-plans examined are shown under classifications 2-17, inclusive, in Table I. Other sorts of space-provision for science made once or twice each are rooms or laboratories for geology, sound, telegraphy, dairy, aquarium, specimens, museum, preparations, etc. The numbers and percentages given for science rooms indicate that there was a slight tendency during the decade away from unspecialized science laboratories. This is seen to be in accordance with the frequency of the percentages of the provisions for most of the special sciences to increase.

Listed in the order of their frequency of appearance in all the plans, these provisions for special sciences are as follows: chemistry, 57.7 per cent; physics, 53.8 per cent; biology, 31.4 per cent; physiography, 13.4 per cent; botany, 9.6 per cent; zoölogy, 6.4 per cent; electrical, 5.8 per cent; physiology, 4.5 per cent; general science, 3.8 per cent; agriculture 1.9 per cent. Thus, chemistry, physics, and biology are the only sciences that are given anything like frequent recognition in these plans. One is not a little surprised to find agriculture at the foot of the list, even for the high schools in communities of 10,000 and less.

Something as to the *extent* of the space-provisions for science may be learned from an examination of Table II. In the first horizontal row this table reports the numbers and percentages of plans in which no rooms were assigned specifically to science. This is more often true in the smaller than in the larger communities. It may not often mean that no rooms are set aside for use in science instruction. It is more likely that it signifies that in most instances some class- or recitation-room or rooms will be used for instruction in science. In the second row are presented the numbers and percentages of floor-plans that make provisions for undifferentiated science rooms or laboratories only. The figures are seen to be approximately equal—with a slight tendency to decrease—for the two half-decades, but unequal for high schools in the smaller and in the larger communities. In the latter, science rooms only are seldom provided. Consonant with this practice, as may be seen in the third and fourth rows, is the tendency in these larger communities to assign special rooms or laboratories to each of the sciences. These larger communities also provide a greater number of special science rooms, as may be seen by the drift of the distributions toward the lower divisions of the columns headed "Communities of more than 10,000" in the remaining horizontal rows of Table II. There was very

TABLE II  
SPACE-PROVISIONS FOR SCIENCE IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS

SPACE-PROVISION	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908-12			1913-17			1908-17			1908-12			1913-17			1908-17		
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent		
No assigned science rooms or laboratories.....	9	22.5	10	22.7	19	22.6	3	9.4	8	20.0	11	15.3	12	16.7	18	21.4	30	19.2
Science rooms or laboratories only.....	10	25.0	10	22.7	20	23.8	2	6.3	2	5.0	4	5.6	12	16.7	12	14.2	24	15.4
Special science rooms or laboratories only.....	19	47.5	24	54.6	43	51.2	21	65.6	28	70.0	49	69.5	40	55.6	52	61.9	92	59.0
Both science and special science rooms.....	2	5.0	.....	.....	2	2.4	6	18.8	2	5.0	8	11.1	8	11.1	2	2.4	10	6.4
1 special science room or laboratory.....	12	5.0	6	13.6	8	9.5	4	12.5	1	2.5	5	7.0	6	8.3	7	8.3	13	8.3
2 special science rooms or laboratories.....	11	27.5	10	22.7	21	25.0	5	15.6	8	20.0	13	18.1	16	22.3	18	21.4	34	21.8
3 special science rooms or laboratories.....	7	17.5	8	18.2	15	17.9	5	15.6	7	17.5	12	16.7	12	16.7	15	17.9	27	17.3
4 special science rooms or laboratories.....	1	2.5	1	2.3	2	2.4	7	21.9	7	17.5	14	19.5	8	11.1	8	9.5	16	10.3
5 special science rooms or laboratories.....	.....	.....	.....	.....	4	4	12.5	5	12.5	5	12.5	4	5.6	5	6.0	9	5.8	
6 special science rooms or laboratories.....	.....	.....	.....	.....	1	1.2	1	3.1	1	2.5	2	2.8	1	1.4	2	2.4	3	1.9
7 special science rooms or laboratories.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1.2	1	0.6
8 special science rooms or laboratories.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Number of floor-plans in group.....	40	.....	44	.....	84	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....

little, if any, tendency to provide more of the special science rooms in the latter half than in the former half of the decade. The more common practices in "All communities" throughout the decade are the provision of 2, 3, or 4 of such special science rooms or laboratories.

*Shop and allied work.*—Something may be learned of the character and extent of the space-provisions for manual training and allied work (including printing) by examination of Table I, 18-40 and Table III. The following additional rooms are provided in one or two of the floor-plans examined: automobile, cement, blue-printing, dry-kiln, pottery, woodcarving, masonry, and pattern-making. The figures for "All communities" in Table III indicate that the proportion of high-school plans which made no provision whatever for this work diminished from the first to the second half-decade from an approximate third to an approximate seventh, less than one-fourth of all the 156 plans failing to make such recognition. While the proportion of plans making provision for undifferentiated manual training only increases in both the smaller and in the larger communities (Table III), the tendency is more marked in the former group. Slight qualification may be made on these interpretations owing to the fact that a few plans in both groups, although providing two or more rooms for the work, assigned them all to manual training. It is more than likely that in most cases it was planned to use one or more of these rooms for special lines of shopwork. Rooms assigned to special lines of shop- and allied work are, as is to be anticipated, much more frequently provided in the larger than in the smaller communities. Moreover, the figures for the half-decades indicate that such assignments, which are provided with only slightly greater frequency in the latter, are not on the increase in the former. The nine most commonly appearing space-provisions for the line of work under consideration, in the order of their frequency of appearance in all of the 156

**TABLE III**  
**SPACE-PROVISIONS FOR MANUAL TRAINING AND ALLIED WORK IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS**

SPACE-PROVISION	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908-12		1913-17		1908-17		1908-12		1913-17		1908-17		1908-12		1913-17		1908-17	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
No assigned manual-training rooms or shops.....	17	42.5	8	18.2	25	29.8	8	25.0	4	10.0	12	16.7	25	34.7	12	14.2	37	23.7
Manual-training rooms or shops only.....	13	32.5	24	54.6	37	44.0	6	18.8	11	27.5	17	23.6	19	26.4	35	41.7	54	34.6
Special rooms or shops only.....	6	15.0	7	15.9	13	15.5	14	43.8	23	57.5	37	51.4	20	27.8	30	35.7	50	32.1
Both manual-training and special rooms or shops.....	4	10.0	5	11.4	9	10.7	4	12.5	2	5.0	6	8.3	8	12.5	7	8.3	15	9.6
1 special room or shop.....	3	7.5	7	15.9	10	11.9	1	3.1	4	10.0	5	7.0	4	5.6	11	23.1	15	9.6
2 special rooms or shops.....	2	5.0	3	6.8	5	6.0	2	6.3	2	5.0	4	5.6	4	5.6	5	6.0	9	5.8
3 special rooms or shops.....	3	7.5	1	2.3	4	4.8	2	6.3	3	7.5	5	7.0	5	7.0	4	4.8	9	5.8
4 special rooms or shops.....	2	5.0	1	2.3	3	3.6	2	6.3	3	7.5	5	7.0	4	5.6	4	4.8	8	5.1
5 special rooms or shops.....	.....	.....	.....	.....	.....	.....	4	12.5	1	2.5	5	7.0	4	5.6	1	1.2	5	3.2
6 special rooms or shops.....	.....	.....	.....	.....	.....	.....	4	12.5	6	15.0	10	13.9	4	5.6	6	7.1	10	6.4
7 special rooms or shops.....	.....	.....	1	2.3	1	1.2	1	3.1	3	7.5	3	4.2	1	1.4	2	2.4	4	2.6
8 special rooms or shops.....	.....	.....	.....	.....	.....	.....	2	6.3	1	2.5	1	1.4	2	2.8	2	1.2	1	0.6
9 special rooms or shops.....	.....	.....	2	4.5	2	2.4	2	6.3	.....	.....	2	2.8	.....	.....	2	2.4	4	2.6
10 or more special rooms or shops.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Number of floor-plans in group.....	40	.....	44	.....	84	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....

plans, are as follows: manual training, 43.6 per cent; mechanical drawing, 35.3 per cent; stock- or lumber-room, 26.3 per cent; machine, 20.5 per cent; forge or blacksmithing, 18.6 per cent; woodworking, 16.0 per cent; foundry or moulding, 12.2 per cent; tool, 10.9 per cent; woodturning, 10.3 per cent. Further information on the extent of space-provision may be had by noting the number of special rooms and the frequency with which each number is assigned, as shown in the lower portions of Table III. Addition of the percentages in the extreme right-hand column will show that about a sixth of all the plans provide five or more rooms for differentiations in this field, almost all of these being in the group of larger communities.

*Domestic-science and art-rooms.*—The different kinds of space provision for domestic science and art are listed under classifications 41–56 in Table I. A nursing-room also is reported in one of the high-school plans examined. The figures in the first row of Table IV show clearly that the proportion of high-school buildings not making provision for work in this line is definitely on the decline, the decrease being more marked in the larger than in the smaller communities. But a comparison of these figures with those for manual training (Table III) will show that the latter is somewhat more frequently provided for in the plans. Figures in both tables show also that, although special rooms are being assigned more frequently during the second half-decade than during the first, both in the smaller and the larger communities, this tendency is more clearly marked in the latter. Consonant with this situation is the fact (Table IV) that while undifferentiated domestic-science rooms, or laboratories, were on the increase in the smaller communities, they decreased in frequency in the high schools of the larger communities. Demonstration, or practice, apartments are also being more frequently provided than formerly, although here again we find the trend more marked in the larger communities. Listed in the order of frequency,

TABLE IV  
SPACE-PROVISIONS FOR DOMESTIC SCIENCE AND ART IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS

SPACE-PROVISION	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908-12			1913-17			1908-17			1908-12			1908-17			1908-12		
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
No assigned domestic-science rooms or laboratories.....	19	47.5	12	27.3	31	36.9	9	28.1	4	10.0	13	18.1	28	38.9	16	21.4	44	28.2
Domestic-science rooms or laboratories only.....	9	22.5	17	38.6	26	31.0	6	18.8	4	10.0	10	13.9	15	20.9	21	25.0	36	23.1
Special rooms or laboratories only.....	9	22.5	11	23.9	20	23.8	7	21.9	14	35.0	21	29.2	16	22.3	25	29.3	41	26.3
Both domestic-science and special rooms or laboratories.....	1	2.5	1	2.3	2	2.4	7	21.9	3	7.5	10	13.9	8	11.1	4	4.8	12	7.7
Domestic-science rooms and apartmentments.....	1	2.5	.....	.....	1	1.2	.....	.....	2	5.0	2	2.8	1	1.4	2	2.4	3	1.9
Special rooms or laboratories and apartmentments.....	1	2.5	2	4.5	3	3.6	2	6.3	12	30.0	14	19.5	3	4.2	14	16.7	17	10.9
Domestic-science rooms, special rooms, and apartments.....	.....	.....	1	2.3	1	1.2	1	3.1	1	2.5	2	2.8	1	1.4	2	2.4	3	1.9
Total number having apartment.....	2	5.0	4	9.1	6	7.1	4	12.5	15	37.5	19	26.4	6	8.3	12	13.6	25	16.0
No apartment.....	38	95.0	40	91.0	78	92.9	28	87.5	25	62.5	53	73.7	68	91.7	65	77.4	131	84.0
1 special room or laboratory.....	3	7.5	.....	.....	3	3.6	.....	.....	2	5.0	12	16.7	9	12.2	12	14.3	15	9.7
2 special rooms or laboratories.....	4	10.0	7	15.0	11	13.1	6	18.8	9	22.5	12	16.7	10	13.2	13	15.5	23	14.7
3 special rooms or laboratories.....	.....	.....	2	4.5	6	7.1	3	9.4	7	17.5	8	10.7	10	12.5	8	9.5	18	11.5
4 special rooms or laboratories.....	.....	.....	3	6.8	3	3.6	.....	.....	5	12.5	6	8.3	3	4.2	8	9.5	11	7.0
5 special rooms or laboratories.....	.....	.....	.....	.....	.....	.....	1	3.1	3	7.5	6	8.3	1	1.4	5	5.9	6	3.6
6 special rooms or laboratories.....	.....	.....	.....	.....	.....	.....	1	3.1	4	10.0	5	6.7	1	1.4	9	10.5	7	4.5
7 special rooms or laboratories.....	.....	.....	1	2.3	2	2.4	1	3.1	1	2.5	2	2.8	1	1.4	2	2.4	3	1.9
8 special rooms or laboratories.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2.5	1	1.4	.....	.....	1	1.2	1	0.6
Number of floor-plans in group.....	40	.....	44	.....	84	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....

the space-provisions made in at least 10 per cent of all the 156 floor-plans are as follows: cooking-room, 42.3 per cent; sewing-room, 38.5 per cent; domestic-science room, 34.6 per cent; dining-room, 33.3 per cent; pantry, 20.5 per cent; supply-room, 19.9 per cent; laundry, 14.1 per cent; fitting-room, 13.4 per cent; bedroom, 11.5 per cent. As a domestic-science room, or laboratory, very frequently signifies a cooking laboratory, it may be seen that assignment of rooms for this special line of work is made with much greater frequency than for any other of the group. The lower portion of Table IV, which reports the numbers of special rooms and the numbers and percentages of buildings in which such numbers of rooms are assigned, shows that the number of special rooms for this work is increasing in communities both large and small, but more rapidly in the latter. Less than a ninth of all of the 156 plans provide five or more special rooms.

*Commercial-rooms.*—Classifications 57-63 of Table I and Table V set forth the main findings as to kinds and extent of space-provisions for commercial work in the floor-plans examined. In addition to the classifications listed, rooms for business practice, model offices, museums, and real estate are provided in one or two of the floor-plans examined. The first horizontal row of figures in Table V shows a very large proportion of high-school floor-plans in which no rooms are assigned to commercial work. This proportion is much larger than for shopwork and domestic science. It is likely that in a number of the high schools in which no such provisions are made it is planned to use regular classrooms for this work, and that, therefore, the figures here given do not represent the actual facts as to space-provision for the activities in this line. The tables show that undifferentiated and single commercial rooms are not to any notable extent increasing in prevalence, but that, on the other hand, special rooms for special subjects in this field are on the increase, particularly



TABLE V  
SPACE-PROVISIONS FOR COMMERCIAL WORK IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS

SPACE-PROVISION	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908-12		1913-17		1908-17		1908-12		1913-17		1908-17		1908-12		1913-17		1908-17	
	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent
No assigned commercial rooms.....	28	70.0	23	52.3	51	60.7	12	37.5	20	50.0	32	44.5	40	55.6	43	51.2	83	53.2
Single commercial rooms only.....	1	2.5	4	9.1	5	6.0	3	9.4	2	5.0	5	7.0	4	5.6	6	7.1	10	6.4
More than one unspecialized commercial room.....																		
Special rooms only.....	1	2.5	11	25.0	1	1.2	4	12.5			4	5.6	5	7.0			5	3.2
Both commercial and special rooms.....	5	12.5	6	13.6	16	21.4	7	21.0	11	27.5	18	25.0	12	16.7	22	26.2	34	21.8
1 special room.....	4	10.0	3	6.8	7	8.3	6	18.8	7	17.5	13	18.1	11	15.3	13	15.5	24	15.4
2 special rooms.....	5	12.5	8	18.2	13	15.5	5	15.6	6	15.0	10	13.0	8	11.1	9	10.7	17	10.9
3 special rooms.....	1	2.5	4	9.1	5	6.0	4	12.5	3	7.5	9	12.5	10	13.0	12	14.2	22	14.1
4 special rooms.....			1	2.3	1	1.2	4	12.5	5	12.5	7	9.7	5	7.0	7	8.3	12	7.7
5 special rooms.....			1	2.3	1	1.2					5	7.0			6	7.1	6	3.8
Number of floor-plans in group.....	40		44		84		32		40		72		72		84		156	

in the smaller communities. The space-provisions for commercial work in the order of frequency of appearance are as follows: typewriting, 29.4 per cent; commercial, 26.3 per cent; bookkeeping, 17.9 per cent; stenography, 13.4 per cent; banking, 9.6 per cent; stenography and typewriting, 3.8 per cent; geography, 2.6 per cent. The lower portion of Table V reports the numbers of special rooms and the numbers and percentages

TABLE VI

SPACE-PROVISIONS FOR ART IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS				COMMUNITIES OF MORE THAN 10,000			
	1908-12		1913-17		1908-12		1913-17	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
Art.....	7	17.5	11	25.0	15	46.9	23	57.5
Number of floor-plans in group.....	40	.....	44	.....	32	.....	40	.....

of building plans in which such numbers of rooms are assigned. These figures show that the number of special rooms is increasing. The number of special rooms, however, is not as large as for manual training and domestic science, as may be seen by a comparison of the figures in Table V with those in Tables III and IV.

*Art-rooms.*—Facts concerning the main sorts of space-provision for art are presented under classifications 64-67 of Table I and in Table VI. In addition to the space-provisions listed in Table I, provision is made also in one or two floor-plans for arts and crafts, crafts, water-color, modeling, and book-binding. The two tables to which reference has been made show that such space-provisions are on the increase and that they are more commonly made in the larger than in the

smaller communities. Rooms for freehand drawing are much more frequently provided than other special rooms. A fact not shown in the tables which is deserving of attention is that it is very seldom that more than one such room is provided, the tendency to provide more being more marked, of course, in the larger than in the smaller communities.

*Music-rooms.*—Special rooms for music (I, 68) are being provided with increasing frequency in both large and small communities, but are more prevalent in the latter. They are still far from common.

*Library-rooms.*—Space-provisions for the library (I, 69-70) are made in approximately two-thirds of all floor-plans examined. Probably the small decrease in percentage from the first to the second half-decade has little sinister significance. Not many high schools are providing both stackrooms and reading-rooms.

*Club-, society-, and recreation-rooms.*—Although still far from common, these space-provisions are being made with increasing frequency (I, 71).

*Gymnasiums and allied space-provisions.*—When the percentages for both common and boys' and girls' gymnasiums (I, 72-74) are added, we find almost two-thirds of the floor-plans making provision for them. There is not a marked difference between the percentages for the smaller and the larger communities. This space-provision was scarcely more frequently made in the second half-decade than in the first. Running-tracks and swimming-pools (I, 75-76) are not common, but show some tendency to increase. Shower-rooms (I, 77) show an increase in frequency in the smaller communities, but the proportion of high schools in these communities providing them is, even during the second half-decade, less than for the larger communities. Approximately a third of all the plans make provision for them. Dressing-rooms are not as often provided as we should anticipate were there not

such a large percentage of locker-rooms for the two sexes (I, 82-83). Offices for physical directors do not seem to school authorities as yet to have attained the place of a necessity except in some of the larger communities.

*Locker- and cloak-rooms.*—Locker-rooms or cloakrooms (I, 81-84), or both, are provided in most high-school buildings. The former increased much more in proportional frequency during the two half-decades in the smaller than in the larger communities. Common locker-rooms are not nearly as often provided as are separate locker-rooms for the sexes. This situation is somewhat accentuated by the presence of the locker-rooms in the neighborhood of the gymnasiums. A few plans provide for both common and boys' and girls' locker-rooms. The facts as to the space-provisions for lockers would have been more useful had it been possible to distinguish between those intended for general use by the student and those to be used in connection with some special activity, as physical training, manual arts, etc.

*Auditoriums, assembly, study, and session rooms.*—More than three-fourths of all the plans examined provide either an auditorium or an assembly room (I, 85), this proportion being almost uniform for smaller and larger communities in both half-decades. Stages and dressing-rooms (I, 86-87) for these are more common in the high schools of the larger communities and are on the increase in both smaller and larger communities. Study-halls, or rooms, (I, 88) are becoming more common. It is pertinent to mention here a fact which does not appear in the table, that, when study-halls, or -rooms, are provided, they are almost always (in 50 out of 59 instances) accompanied by a provision in the same plan for auditoriums or assembly rooms and are two to several in number.

*Lunchrooms.*—Common and boys' and girls' lunchrooms (I, 90-92) appear in slightly more than a third of all plans examined, the common type being provided in approximately

twice as many plans as the segregated type. High schools in smaller communities do not as frequently provide lunchrooms as do those in the larger ones. Furthermore, kitchens in connection with these lunchrooms are seldom provided in high schools of the former group, but are provided in almost a fourth of the latter. A fact not appearing in the table is that two of the high schools also provide an instructors' lunchroom.

*Office-rooms.*—Although most building plans provide for a principal's office (I, 94), a small proportion fail to do so. This failure is more marked in the smaller communities. Approximately half of the high schools in the larger cities also provide reception or waiting-rooms (I, 95); in the smaller cities this proportion drops to somewhat less than a third of all high schools. Vaults (I, 96) for the principal's office and offices for assistant principals (I, 97) and for teachers (I, 98) are not provided in a large proportion of buildings, but all three are more common in the larger than in the smaller communities.

*Rest and emergency rooms.*—Classifications 99–103 of Table I present the fact concerning the provision of rest and emergency rooms. Because there is some confusion as to the meaning of the terms "rest room" and "emergency room," it has been difficult to make a fully satisfactory classification of the several sorts of space-provision that fall in these categories. In some plans the same room was designated as an emergency and rest room. The figures, however, show a tendency—somewhat more marked for women teachers' rest rooms and emergency and rest rooms than for the other classifications—toward an increase of recognition of this group of space-provisions. Rooms of one or more of the kinds named have been provided in the plans of approximately three-fourths of all the floor-plans examined.

*Other space-provisions.*—Textbook rooms (I, 104) are not often given a place; no doubt this room will not often be assigned where the system does not supply the textbooks to

students. Storage-rooms (I, 105) increased in frequency during the decade and were provided in slightly more than half the plans examined. The janitor has a room (I, 106) in almost a third of the buildings. Toilets (I, 107-8) are not quite as nearly universal in the plans as is to be desired. The deficiency is to be explained in part by their omission from the plans in some of the smaller and even larger communities where no facilities for sewage disposal are at hand. In a small percentage of instances toilet accommodations of an adequate sort are provided in annexes. A small proportion of plans set aside space for bicycle-rooms (I, 109).

*Relative frequency of the space-provisions.*—Before leaving consideration of particular space-provisions attention will be directed to their relative frequency, which is not readily apparent in Table I. In order to emphasize relative frequency, the kinds of space-provision have been grouped according as they fall in decreasing percentage classifications and ranked in the order of this decreasing frequency in all the 156 floor-plans. The result is Table VII. As there are many kinds of space-provision appearing with identical percentages of frequency, the number of ranks is only about half the number of kinds of space-provision listed in Table I. A glance at the upper portion of this distribution informs us that only 12 of all the 109 sorts of space-provision are made in more than 50 per cent of the floor-plans. This is to say that a majority at least of those who have authorized the construction of the 156 high-school buildings whose plans were examined for this study regard the following as minimum essentials of such buildings: class- or recitation-rooms, a chemical and physical laboratory, with a lecture or demonstration room for these sciences, an assembly room or auditorium with a stage for same, a library room, a gymnasium, an office for the principal, a room for general storage, and boys' and girls' toilets. Examination of the first horizontal row in each of the supplementary

Tables III and IV will show that to this meager list may be added some provision for manual training and domestic science. Examination of the percentages of Table I by size of community will show that for the larger communities we may also add a laboratory for biology, a mechanical-drawing room, boys' and girls' locker-rooms, and a reception- or waiting-room to the principal's office. On the other hand, if we canvass the percentages of this table for the smaller communities, we note that from the minimal list must be subtracted the space for separate chemical and physical laboratories, the lecture or demonstration room for these two sciences, and the room for storage. It is of interest to note the very wide range of kinds of space-provision not regarded as essential in a majority of the communities. Indeed, the reader can hardly fail to be surprised at the low ranking and percentage found for many of the kinds of space-provision in the lower portions of Table VII.

TABLE VII

SPACE-PROVISIONS IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS  
IN THE ORDER OF FREQUENCY OF APPEARANCE

90-100 per cent:

1. Class- and recitation-rooms, 99.4

80-90 per cent:

2. Principal's office, 86.5
3. Boys' toilets, 82.7
4. Girls' toilets, 82.0

70-80 per cent:

5. Assembly room or auditorium, 76.9

60-70 per cent:

6. Library room, 65.4
7. Stage (in assembly room or auditorium), 61.5

50-60 per cent:

8. Chemistry laboratory, 57.7
9. Gymnasium, 55.1
10. Physics laboratory, 53.8
11. Lecture or demonstration room (for science), 50.6
11. Storage-room, 50.6

## 40-50 per cent:

- 12. Boys' locker-room, 47.4
- 13. Girls' locker-room, 46.8
- 14. Manual-training room or shop, 43.6
- 15. Cooking-room or laboratory, 42.3
- 16. Reception- or waiting-room (to principal's office), 41.7

## 30-40 per cent:

- 17. Sewing-room or laboratory, 38.5
- 18. Study-rooms or halls, 37.8
- 19. Mechanical-drawing or draughting room, 35.3
- 19. Teachers' rest- or retiring-room, 35.3
- 20. Domestic-science room or laboratory, 34.6
- 21. Dressing- or ante-rooms (for stage in auditoriums), 34.6
- 22. Dining-room (for home economics), 33.3
- 23. Janitor's room, 32.7
- 24. Biology laboratory, 31.4
- 24. Lavatories or shower-rooms, 31.4
- 25. Wardrobe or cloakroom, 30.8

## 20-30 per cent:

- 26. Typewriting room, 29.4
- 27. Apparatus room (for science), 28.8
- 28. Commercial room, 26.3
- 28. Stock- or lumber-room (for manual training), 26.3
- 29. Women teachers' restroom, 25.6
- 29. Darkroom (for science), 25.6
- 30. Lunchroom, 24.3
- 31. Science room or laboratory, 21.2
- 32. Freehand drawing room, 20.5
- 32. Pantry (for home economics), 20.5
- 32. Machine room or shop, 20.5

## 10-20 per cent:

- 33. Supply-room (for home economics), 19.9
- 34. Forge or blacksmithing room or shop, 18.6
- 35. Bookkeeping room, 17.9
- 35. Music room, 17.9
- 35. Emergency or rest room, 17.9
- 36. Dressing-rooms (for gymnasium), 16.7
- 37. Teachers' offices, 16.0
- 37. Woodworking room or shop, 16.0
- 38. Men teachers' room, 14.7



- 39. Kitchen (for lunchroom), 14. 1
- 39. Laundry (for home economics), 14. 1
- 40. Stenography or dictation room, 13. 4
- 40. Fitting-room (for home economics), 13. 4
- 40. Physiography laboratory, 13. 4
- 41. Foundry or moulding room or shop, 12. 2
- 41. Girls' lunchroom, 12. 2
- 42. Bedroom (for home economics), 11. 5
- 43. Tool room, 10. 9
- 43. Physical director's office, 10. 9
- 43. Boys' lunchroom, 10. 9
- 43. Vault (in principal's office), 10. 9
- 44. Woodturning room or shop, 10. 3
- 44. Finishing room, 10. 3
- 44. Assistant or vice-principal's office, 10. 3
- 5-10 per cent:
  - 45. Botany laboratory, 9. 6
  - 45. Living- or reception-room (for home economics), 9. 6
  - 45. Banking-room, 9. 6
  - 45. Boys' gymnasium, 9. 6
  - 45. Locker-room, 9. 6
  - 46. Club-, society-, or recreation-room, 8. 9
  - 46. Girls' gymnasium, 8. 9
  - 46. Bicycle-room, 8. 9
  - 47. Running-track, 7. 7
  - 47. Art room, 7. 7
  - 47. Textbook room, 7. 7
  - 48. Greenhouse or conservatory, 7. 0
  - 48. Swimming-pool or natatorium, 7. 0
  - 49. Zoölogy laboratory, 6. 4
  - 49. Cabinet-making room or shop, 6. 4
  - 49. Library stackroom, 6. 4
  - 49. Girls' restroom, 6. 4
  - 50. Electrical laboratory, 5. 8
  - 50. Forge and foundry room or shop, 5. 8
  - 50. Millinery room or laboratory, 5. 8
  - 50. Bathroom (for home economics), 5. 8
  - 50. Exhibit hall or room (for art), 5. 8
- 1.9-5 per cent:
  - 51. Physiology laboratory, 4. 5

- 51. Benchroom or shop, 4.5
- 51. Lathe room or shop, 4.5
- 51. Sewing- and millinery-room or laboratory, 4.5
- 52. Elementary or general science room or laboratory, 3.8
- 52. Carpentry room or shop, 3.8
- 52. Art-metal room or shop, 3.8
- 52. Printing-room or shop, 3.8
- 52. Stenography and typewriting room, 3.8
- 53. Balance-room, 3.2
- 53. Millroom, 3.2
- 53. Modeling-room, 3.2
- 53. Woman physical director's office, 3.2
- 54. Joinery room or shop, 2.6
- 54. Sheet-metal shop, 2.6
- 54. Design room or laboratory (for home economics), 2.6
- 54. Domestic or food-chemistry laboratory, 2.6
- 54. Geography room (for commercial work), 2.6
- 55. Agriculture laboratory, 1.9
- 55. Plumbing-room or shop, 1.9
- 55. Stock- and finishing-room, 1.9
- 55. Dressmaking-room or laboratory, 1.9
- 55. Session rooms, 1.9

#### SIGNIFICANCE AND UTILITY OF THE FINDINGS

Certain conclusions of a more general character may be drawn from the specific facts and findings of this study. The examination of the space-provisions in the plans of better high-school buildings erected in this country during two recent and successive half-decades indicates a marked tendency toward the multiplication of facilities for specialization, differentiation, and enrichment of the work of the high-school student. This is illustrated by the movement toward special rooms for the special sciences; by the trend toward the assignment of special rooms for differentiations of the three most common vocational offerings in the high school, viz., shop and allied work, domestic science and art, and commercial work; and by the more frequent provision of space for art,

music, libraries, extra-curricular activities, gymnasiums, etc. It has been frequently noted in this study that—and this is a matter also of common observation—although most of these space-provisions are on the increase in both the smaller and the larger communities, the former are rather commonly lagging behind the latter in the percentages of such recognition. There is a measure of inevitability in this situation. This is owing in part to the financial problem that the smaller communities would need to face were they to attempt to provide buildings allowing for all the specializations and enrichments finding a place in the high schools of the larger communities. But it must also be in large part owing to the smaller enrollments in the high schools and in the vocational make-up of the smaller communities and the consequent relative absence of a need for such a wide range of specializations. We have noted also that in the majority of communities the minimum essentials of a high-school building are considered to be class- and recitation-rooms, chemical and physical laboratories, with a lecture and demonstration room for these sciences, an assembly room or auditorium, with a stage for same, a library room, a gymnasium, an office for the principal, a room for general storage, and boys' and girls' toilets. Although to this minimal list some kinds of space-provision are added in the larger communities, there is a tendency to subtract from it in the smaller communities.

A final word may be said on the uses to which the findings of a study of the kind here reported may be put. It seems to the writer that school authorities contemplating the erection of a high-school building will do well to have before them such a fairly complete list of space-provisions as a study of this kind provides. They may advisedly give some consideration also to the proportion of buildings of recent construction in which each of the many sorts of space-provision has been made. They should without question make themselves aware of the

*trend* in the kinds of space-provisions in both small and large communities. Possibly they may go so far as to be sure to include in their plans provisions for what seem to be regarded in a majority of the plans as the minimum essentials of a high-school building. But to accept blindly the facts presented as the determiners of the kinds and extent of space-provisions to be made in a building would endanger the adaptability of the building whose erection is contemplated to the needs and financial ability of the community. Violation of the criterion of adaptability to local needs would result, for instance, in most of the small communities whose school authorities would determine on the basis of the findings of this study that, because only 2.4 per cent of all high-school buildings in communities with a population of 10,000 and less provide space for instruction in agriculture, no space should be set aside for instruction in this line in the buildings whose plans they are to approve. Violation of the criterion of financial ability would in most cases result from a decision of the authorities in a small community to insist upon making all the sorts of space-provision at all frequently found in this investigation. It is obvious that such a study cannot free those in authority from the duty of giving careful thought to the particular problem before them. It should, however, result in more effective thinking on that problem.